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Satfone Communication set up
User Manual

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Abstract :

This note discribes the Avionics DTE configured as a PAD and the configuration of an AES composed of a Satfone model equipment and a SITA Data-3 Gateway to obtain a downlink or uplink connection between an Avionics DTE and a Ground DTE.

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by

G. RAMBAUD

Summary

This note discribes the Avionics DTE configured as a PAD and the configuration of an AES composed of a Satfone model equipment and a SITA Data-3 Gateway to obtain a downlink or uplink connection between an Avionics DTE and a Ground DTE.

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List of Abbreviations

ADS	Automatic Dependent Surveillance
AES	Aircraft Earth Station
AOR-East	Atlantic Ocean Region-East
ASAP	ARTIC Software Application Program
CMT	Commissioning Maintenance Terminal
D/LNA	Duplexer/Low Noise Amplifier
DNIC	Data Network Identification Code
DTE	Data Terminal Equipment
EC	EiconCard
GES	Ground Earth Station
HPA	High Power Amplifier
IRQ	Interrupt Request
LGA	Low Gain Antenna
NCB	Network Control Block
PAD	Packet Assembler Disassembler
RFU	Radio Frequency Unit
SCM	System Control Module
SDM	System Definition Manual
SDU	Satellite Data Unit
SITA	Society International of Telecommunications Aeronautics
TSR	Terminate and Stay Resident

Glossary

SATFONE	RACAL AES equipment (Data 2 compatible)
Data-2	INMARSAT Standard on AES equipment
Data-3	INMARSAT Standard on AES equipment

References

1. ***EiconCard/PC 1MB*** Installation Guide 203-011-2
2. ***OSI GATEWAY*** Reference Guide Version 3, Release 1
3. ***Satellite AIRCOM*** Data-3 Gateway User's Guide Revision 4 Ref : 3225/PM/DCGI37/92
4. ***Software System Functional Specification*** for the ***Aviation Satellite Communication System***

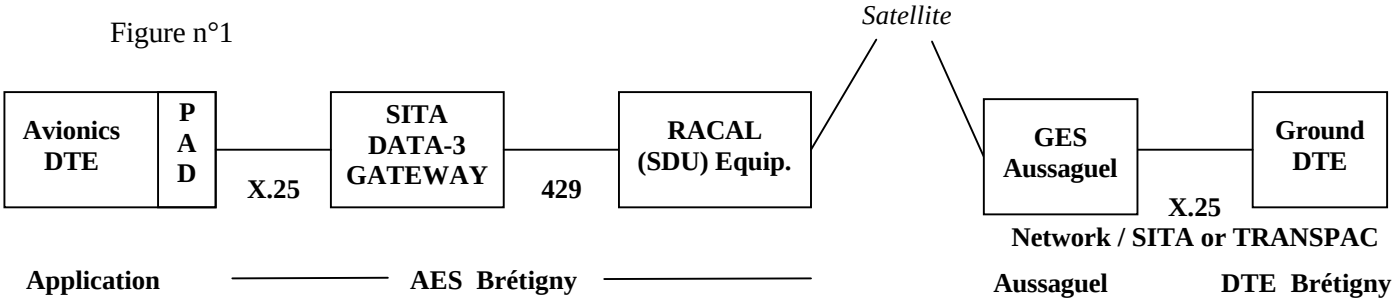
1. Introduction

This booklet describes the realisation of a connection between the AES located at Brétigny and the Aussaguel GES located in the South of France via an INMARSAT satellite.
The communication between AES and GES follows the INMARSAT protocols defined in the INMARSAT System Definition Manual (SDM).
The aim is to obtain a downlink connection established on the avionics request to the earth station, and an uplink connection established on the earth station request to the avionics.
It is necessary to use a Data-3 Gateway between the Avionics DTE and the SDU Data-2 to establish an end-to-end X.25 communication.
This documentation is only available for Satfone model equipment.

2. Purpose

Configuration of an AES and set up for a connection to a GES "AUSSAGUEL" via a communication satellite.
The following figure shows how the modules are linked together.

Figure n°1



2.1 AES description

The AES is composed of :

- a PC "Avionics DTE",
- a PC "SITA Data-3 Gateway" **SITA** owns the software,
- a RACAL Data-2 "SDU" equipment (SATFONE model).

3. Configuration of the PC "Avionics DTE"

The avionics DTE includes :

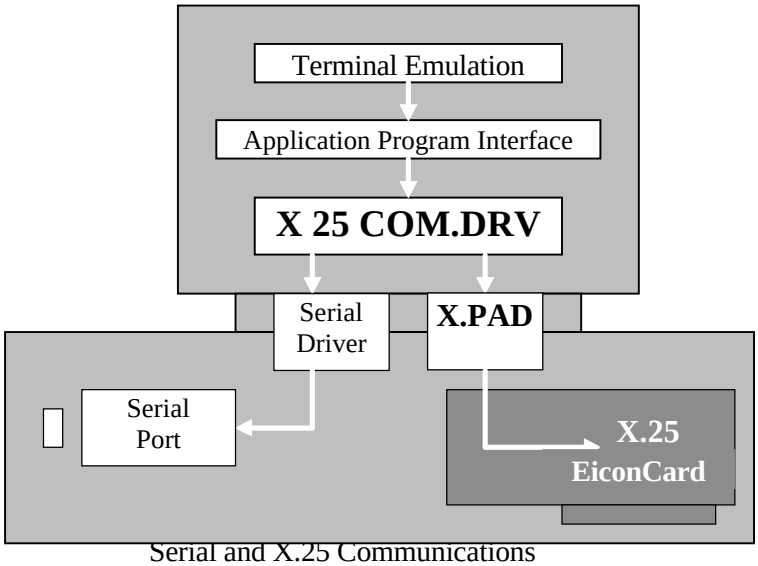
- an EICON card for an X.25 connection to the PC "SITA" (Ref : EiconCard/PC 1MB).

This DTE is configured as a PAD (Figure n°2).

3.1 X.PAD with Windows

With Windows, you should set up your **terminal emulation** to use specific COM ports (terminal emulation written for Windows probably will not offer other choices). An additional driver in the **X.PAD** package, **X25COM.DRV**, provides a run-time link that services both X.PAD and serial drivers used by Windows.
The diagram below shows the standard serial communications scheme under Windows. The terminal emulation program uses the Windows Application Program Interface (API) to communicate with the serial COM ports.
The **API** is a series of Dynamic Link Library (DLL) functions designed for all Windows applications that want to do serial communications. These functions are linked to the application program at run-time.
The Eicon Technology driver **(X25COM.DRV)** is integrated into the Windows environment so that it is linked with both the API and the serial driver. It intercepts all the standard serial function calls and then redirects them to the appropriate driver.
If the data is for a serial COM port, then X25COM will send it to the normal serial driver. Data directed to a COM port designated for X.25 communications will be sent to the X.PAD module and from there to the EiconCard X.25 Gateway.

Figure n°2



Serial and X.25 Communications

Remark : The EC commands are a group of programs that allow to control OSI PC Gateway functions [Ref. 2]. Run them from the command line or in batch files to start and stop the gateway, and obtain status and statistics.

The EiconCard/PC 1 MB is a sophisticated communications card that allows (with the appropriate software) to link to X.25 network.

3.2 EC Commands

The Eicon commands are used to start, configure, test, examine, and stop the Eicon Technology Gateway [Ref. 2].
Test of the EiconCard with a test program (ECTEST.EXE) in directory c:\OSIGATE. It verifies the integrity of the hardware component of the gateway through a series of tests. The EiconCard must be configured with the configuration program before it can be tested.

If you try to run ECTEST without using the /FOrce parameter on an EiconCard that has an application running, a warning will be issued and no tests will be performed. When the /FOrce parameter is used, the EiconCard is halted without warning and ECTEST performs its diagnostics. The EiconCard software must be re-loaded when testing is complete.

ECTEST /FO
Forces deactivation of any loaded EiconCard without warning the operator, and tests them.

ECTEST Display Screen
A screen similar to the following appears when you run ECTEST.

```
C:\OSIGATE>ectest
EiconCard Self-Test Utility
ECTEST 1.06 Rev. 01
Copyright (c) Eicon Technology Corporation 1994. All Rights Reserved

                          -------------------------
                             Card #1: EC/PC

                             CARD CONFIGURATION:

I/O Port Address         :  380
Memory Segment Address   :  d000
Interrupt Request Level  :  5
Memory size              :  1024 K

                               CARD DIAGNOSTIC:

In progress...

EiconCard/PC 1MB, Diagnostic:  Passed

                          -------------------------

                             DIAGNOSTIC SUMMARY:

Card #1: Success.

                          -------------------------
```

You must re-start the PC “Avionics DTE” to re-load the EiconCard software.
Each time an EiconCard is tested, the validity of its configuration (EiconCard type, I/O Address, Memory Segment and IRQ) is verified. If a configuration error is detected, no further tests are performed until a correct EiconCard configuration is created with the configuration program (**ECCFG**) [Ref. 2].

3.3 Hardware set up

- The EiconCard/PC 1MB can use one of seven standard I/O Addresses. The default setting is I/O Address 380h. Switch SW1 sets the I/O address for the EiconCard/PC 1MB [Ref. 1].

I/O Address Switch Positions

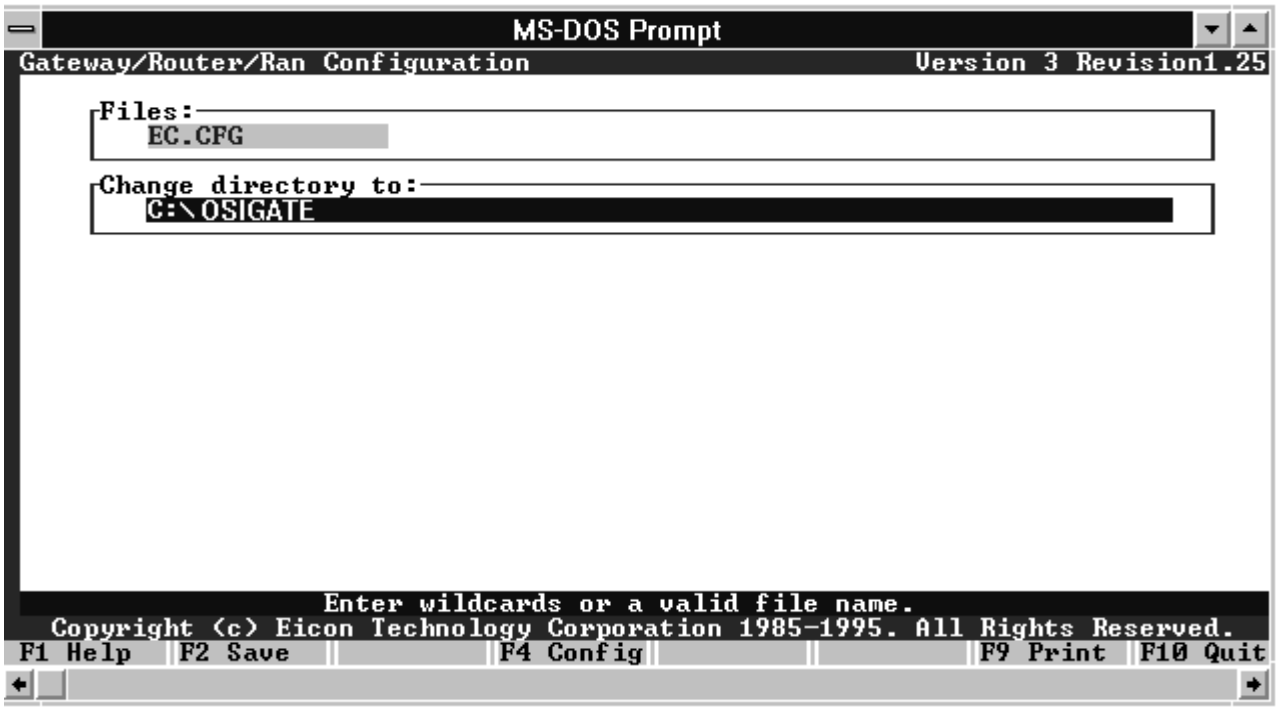
I/O ADDRESS	1	2	3	4
380h	off	off	on	on

- Memory segment address at **0D000** using **IRQ 5**

To configure these parameters run **ECCFG**.EXE, and follow the panels. This file is in the directory c:\OSIGATE.

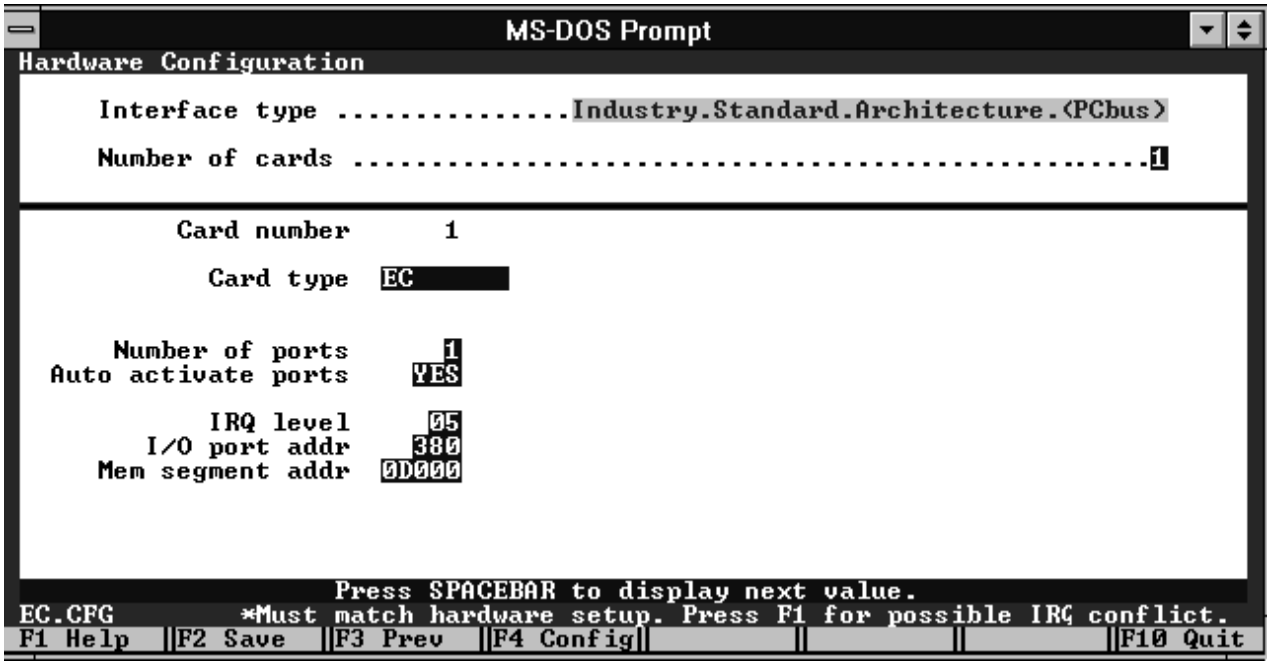
⇒ EiconCard configuration

The following panels are snapshots of the EiconCard ECCFG.EXE program [Ref. 2].They are presented in the order they appear in the program.



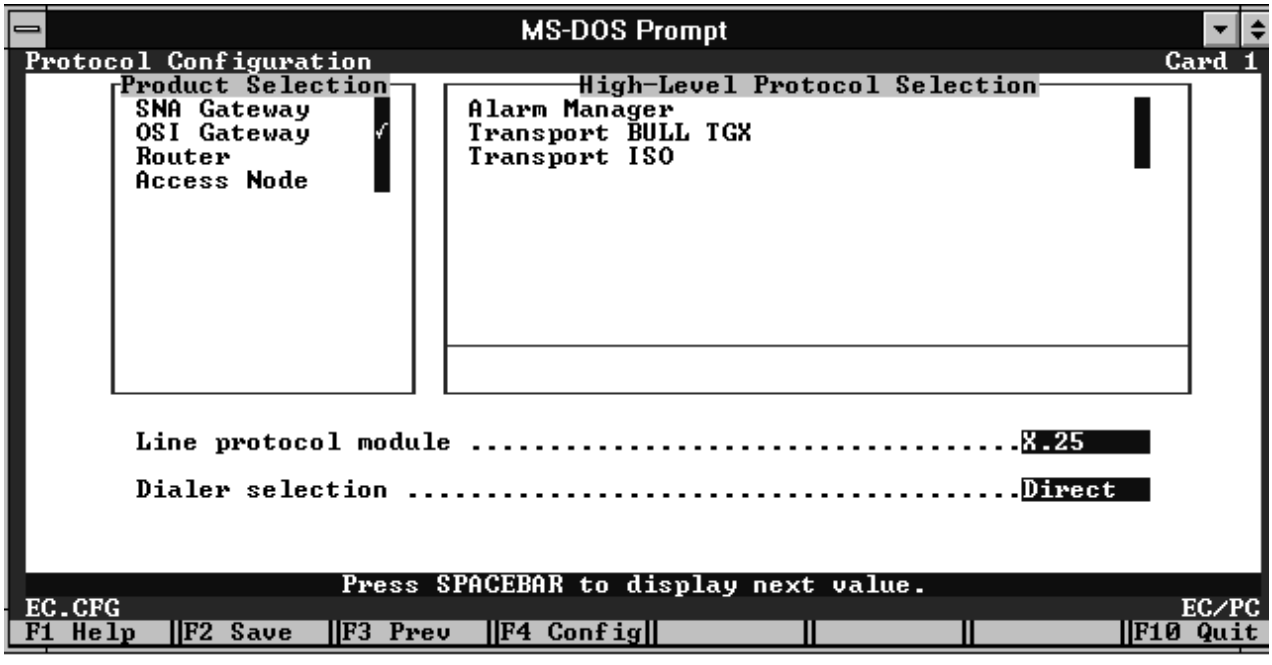
Press **F4** key to continue.

Hardware Configuration Screen


MS-DOS Prompt
Hardware Configuration
Interface type .....Industry.Standard.Architecture.(PCbus)
Number of cards 1
Card number 1
Card type EC
Number of ports 1
Auto activate ports YES
IRQ level 05
I/O port addr 380
Mem segment addr 0D000
Press SPACEBAR to display next value.
EC.CFG *Must match hardware setup. Press F1 for possible IRQ conflict.
F1 Help F2 Save F3 Prev F4 Config F10 Quit

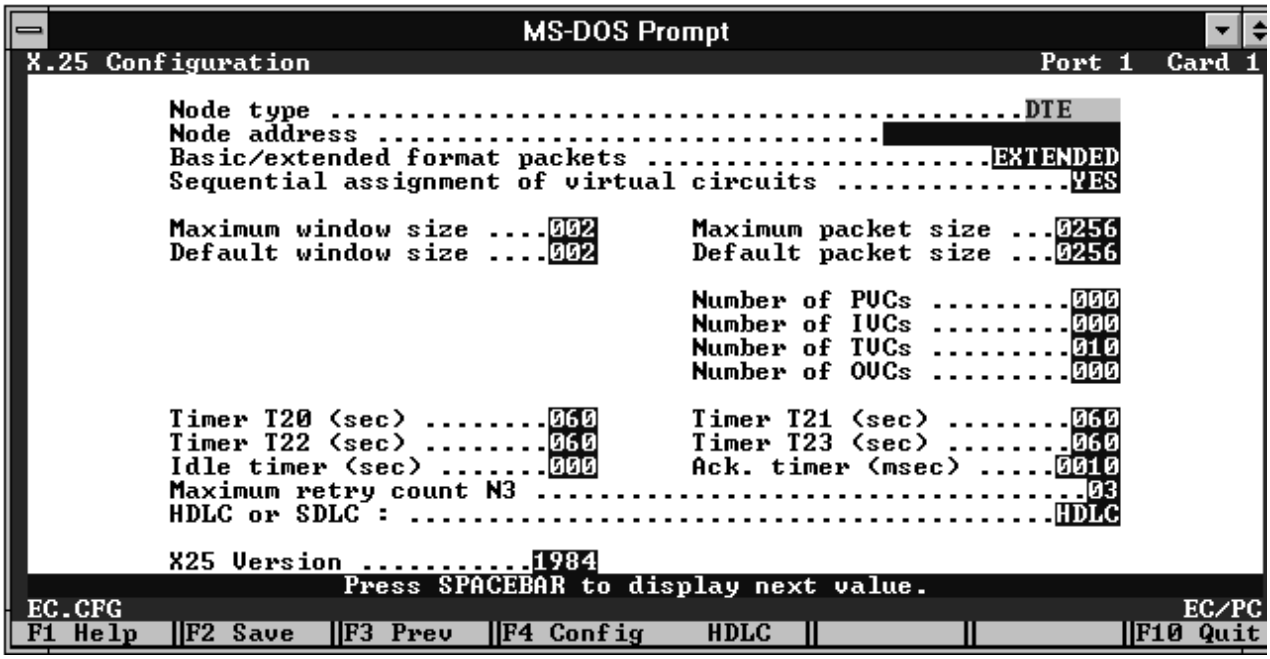
Press **F4** key to continue.

Protocol Configuration Screen



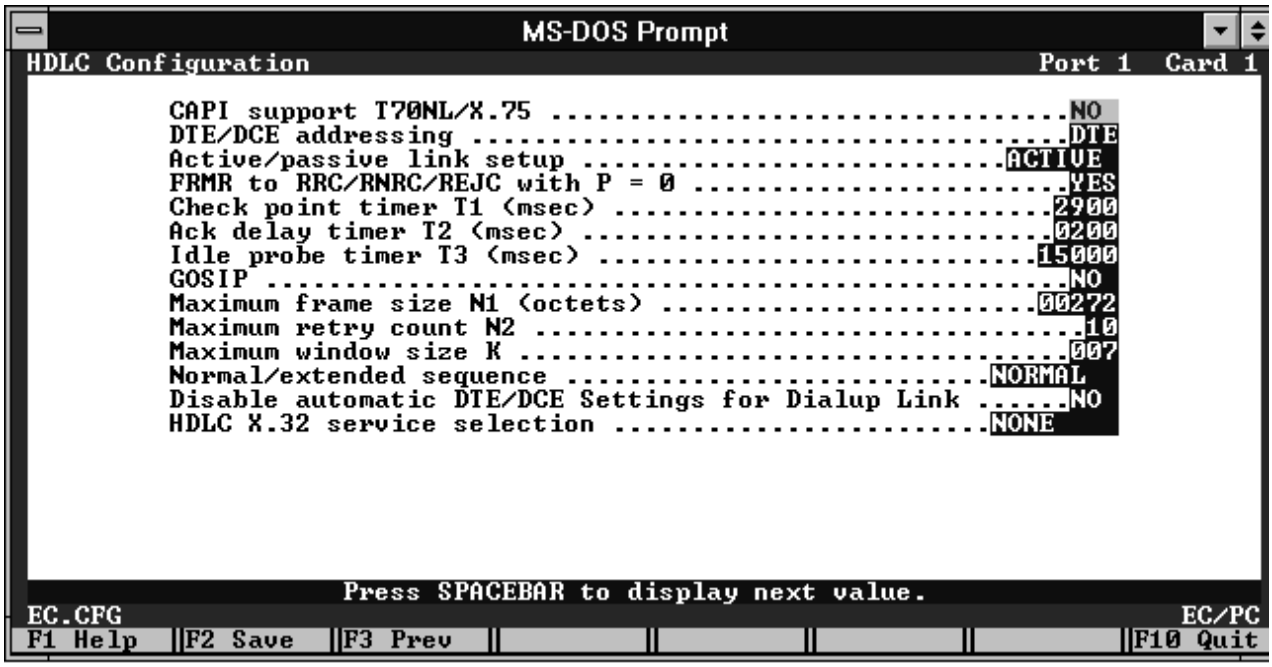
On the Line protocol module select **X.25** then press **F4** key to continue.

X.25 Configuration Screen (Sequential VC)



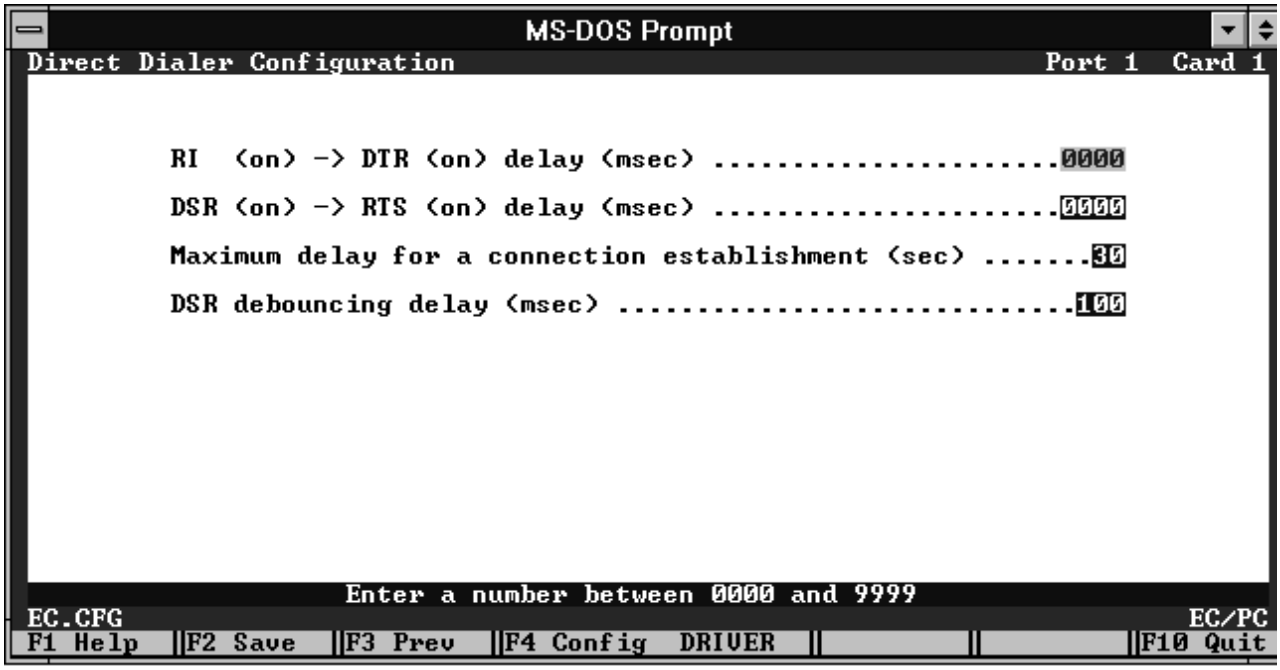
Press **F4** key to continue.

HDLC Configuration Screen


MS-DOS Prompt
HDLC Configuration
Port 1 Card 1
CAPI support T70NL/X.75 .....NO
DTE/DCE addressing .....DTE
Active/passive link setup .....ACTIVE
FRMR to RRC/RNRC/REJC with P = 0 .....YES
Check point timer T1 (msec) 2900
Ack delay timer T2 (msec) 0200
Idle probe timer T3 (msec) 15000
GOSIP .....NO
Maximum frame size N1 (octets) 00272
Maximum retry count N2 10
Maximum window size K 007
Normal/extended sequence .....NORMAL
Disable automatic DTE/DCE Settings for Dialup Link .....NO
HDLC X.32 service selection .....NONE
Press SPACEBAR to display next value.
EC.CFG
EC/PC
F1 Help
F2 Save
F3 Prev
F10 Quit

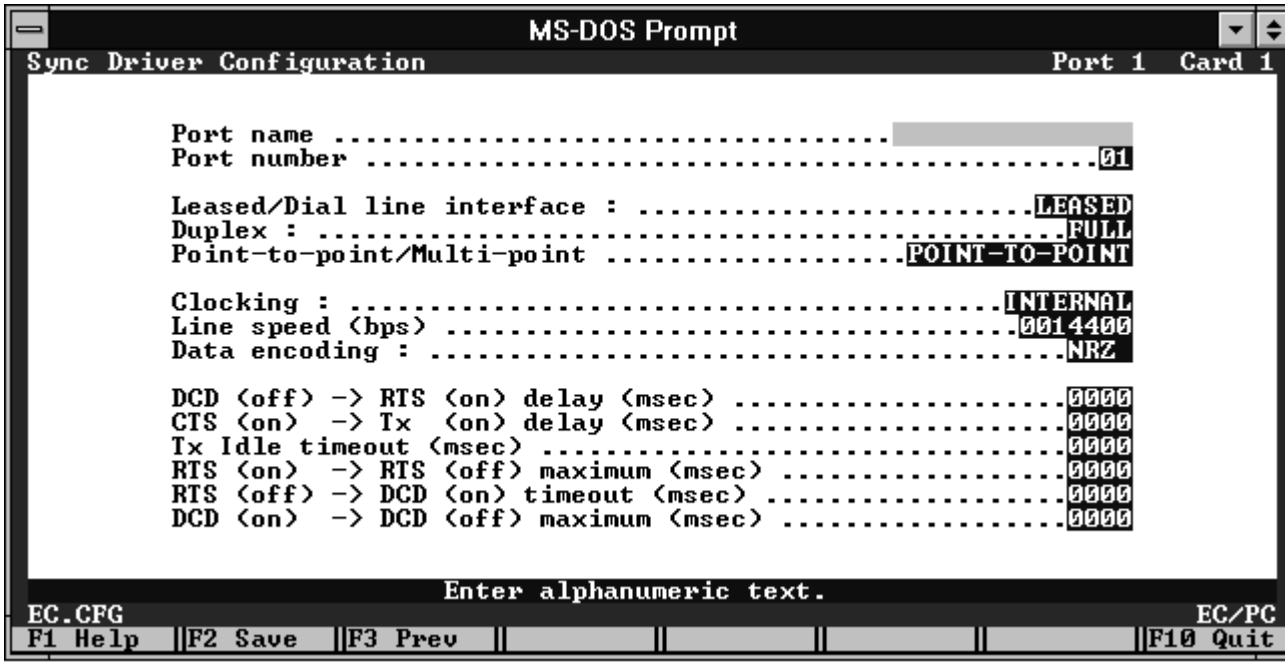
Press twice **F3** key to get back the Protocol Configuration Screen. On the Dialer selection line select **Direct** then press **F4** key to continue.

Direct Dialer Configuration Screen



Press **F4** key to continue.

Sync Driver Configuration Screen



Press **F10** key to quit.

3.4 Software set up

♦ The PAD will run under Windows, therefore the two following programs are needed.

- X25COM.DRV, in directory c:\osigate. It is the X25 communications driver.
- METHOD.EXE, in directory c:\osigate. It is the COM Port Method Utility.

♦ To load the PAD, ECXPAD.INI file is necessary in directory c:\osigate.
The ECXPAD.INI file determines the initial configuration of the X.PAD driver (ECXPAD.EXE), as well as such aspects of the X.PAD environment as the size of the working buffers and the communications interrupt that the driver uses [Ref. 2].

♦ Config.sys and Autoexec.bat of the PC "Avionics DTE" are given in **Annex 1**.

4. Configuration of the PC "SITA data-3 Gateway"

4.1 Functionality

The Data-3 gateway provides the following functions :

Perform the ISO 8208 InterWorking Function as specified in Inmarsat SDM CN 56 Appendix 10. This allows the Gateway to establish, maintain and clear virtual connections (VCs) and relay data between the satellite Sub-Network and X.25 network.

The Data-3 GATEWAY PC has for this reason been fitted with two communication cards :

- an ARTIC 429 Receive/Transmit Interface card.
- an EiconCard/PC 1MB X.25 Interface card with OSI-PC Gateway software.

4.2 EC Commands

The Eicon commands are used to start, configure, test, examine, and stop the Eicon Technology Gateway [Ref. 2].
Test of the EiconCard with a test program (ECTEST.EXE) in directory c:\OSIGATE. It verifies the integrity of the hardware component of the gateway through a series of tests. The EiconCard must be configured with the configuration program before it can be tested.

If you try to run ECTEST without using the /FOrce parameter on an EiconCard that has an application running, a warning will be issued and no tests will be performed. When the /FOrce parameter is used, the EiconCard is halted without warning and ECTEST performs its diagnostics. The EiconCard software must be re-loaded when testing is complete.

ECTEST /FO
Forces deactivation of any loaded EiconCard without warning the operator, and tests them.

ECTEST Display Screen
A screen similar to the following appears when you run ECTEST.

```
C:\OSIGATE>ectest
EiconCard Self-Test Utility
ECTEST 1.06 Rev. 01
Copyright (c) Eicon Technology Corporation 1994. All Rights Reserved

                          -------------------------
                             Card #1: EC/PC

                             CARD CONFIGURATION:

I/O Port Address         :  380
Memory Segment Address   :  d800
Interrupt Request Level  :  3
Memory size              :  1024 K

                               CARD DIAGNOSTIC:

In progress...

EiconCard/PC 1MB, Diagnostic:  Passed

                          ------------------------

                             DIAGNOSTIC SUMMARY:

Card #1: Success.

                          ------------------------
```

You must re-start the PC “SITA Data-3 Gateway” to re-load the EiconCard software.
Each time an EiconCard is tested, the validity of its configuration (EiconCard type, I/O Address, Memory Segment and IRQ) is verified. If a configuration error is detected, no further tests are performed until a correct EiconCard configuration is created with the configuration program (**ECCFG**) [Ref. 2].

4.3 Hardware set up

4.3.1 ARTIC-429 Card Installation

Switches configuration of the card for this Address **0D000 (S1)** and jumpers configuration for an Interrupt Request Level **IRQ5 (JP5)**.You can see the hardware configuration figure n°3.

Note : This configuration cannot be changed. It is up to verify that no other device in the PC is conflicting with these options.

ARTIC-429-Card **View from Above**

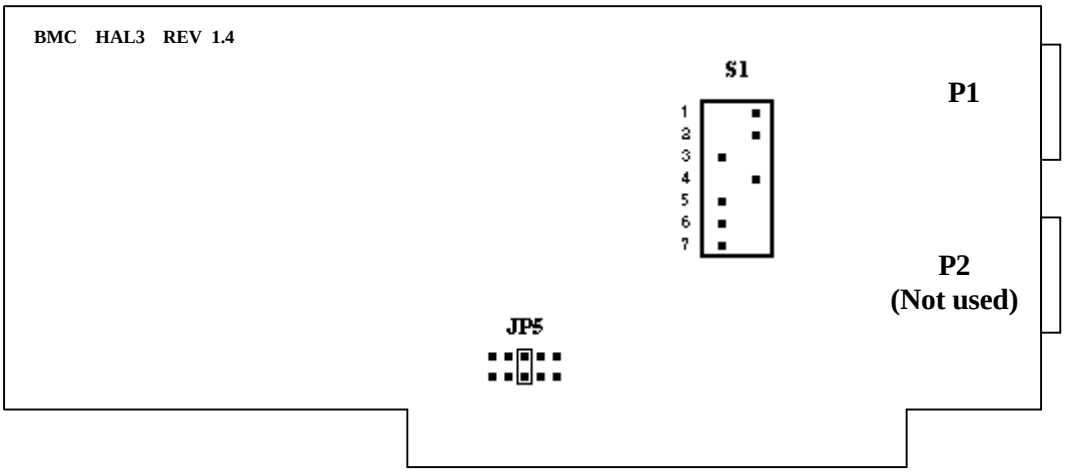


*Figure n°3. **S1** Memory Address Swith and **JP5** IRQ jumper*

4.3.2 EiconCard Installation

The EiconCard/PC 1MB can use one of seven standard I/O Addresses. The default setting is I/O Address 380h. Switch SW1 sets the I/O address for the EiconCard/PC 1MB [Ref. 1].

Switch positions

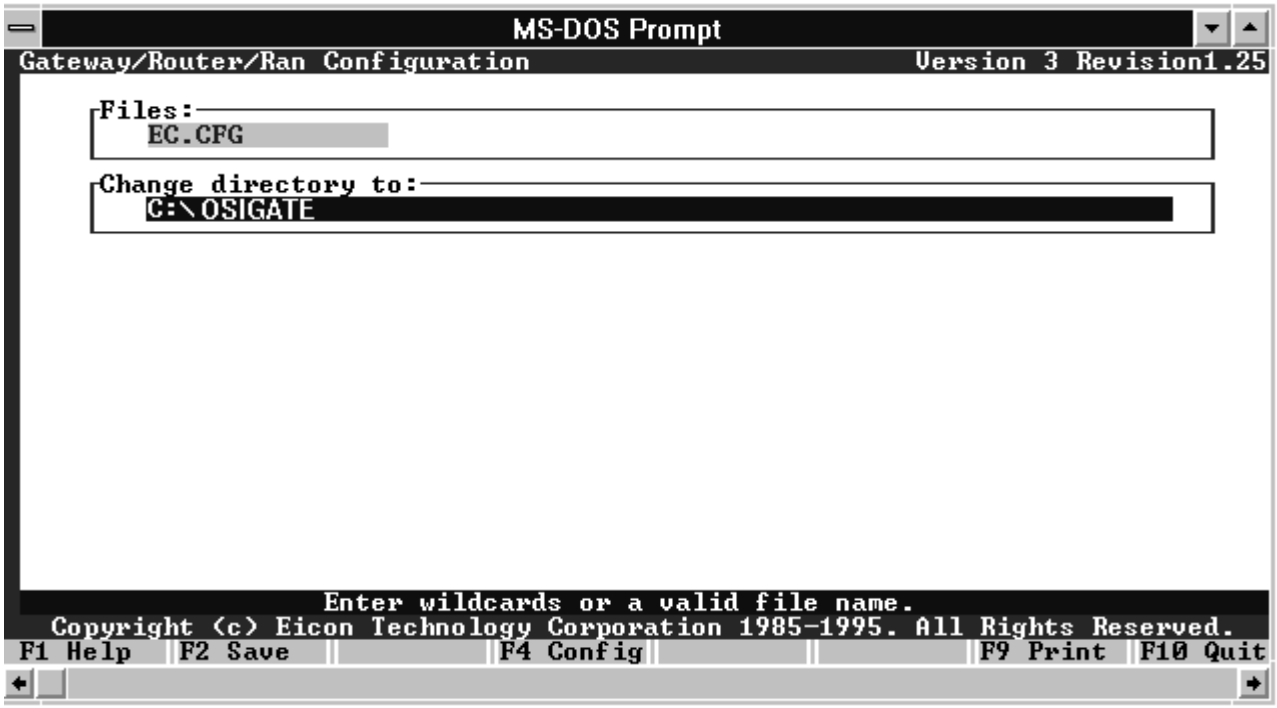
I/O ADDRESS	1	2	3	4
380h	off	off	on	on

- Memory segment address at **0D800** using **IRQ 3**

To configure these parameters run **ECCFG**.EXE, and follow the panels. This file is in the directory c:\OSIGATE .

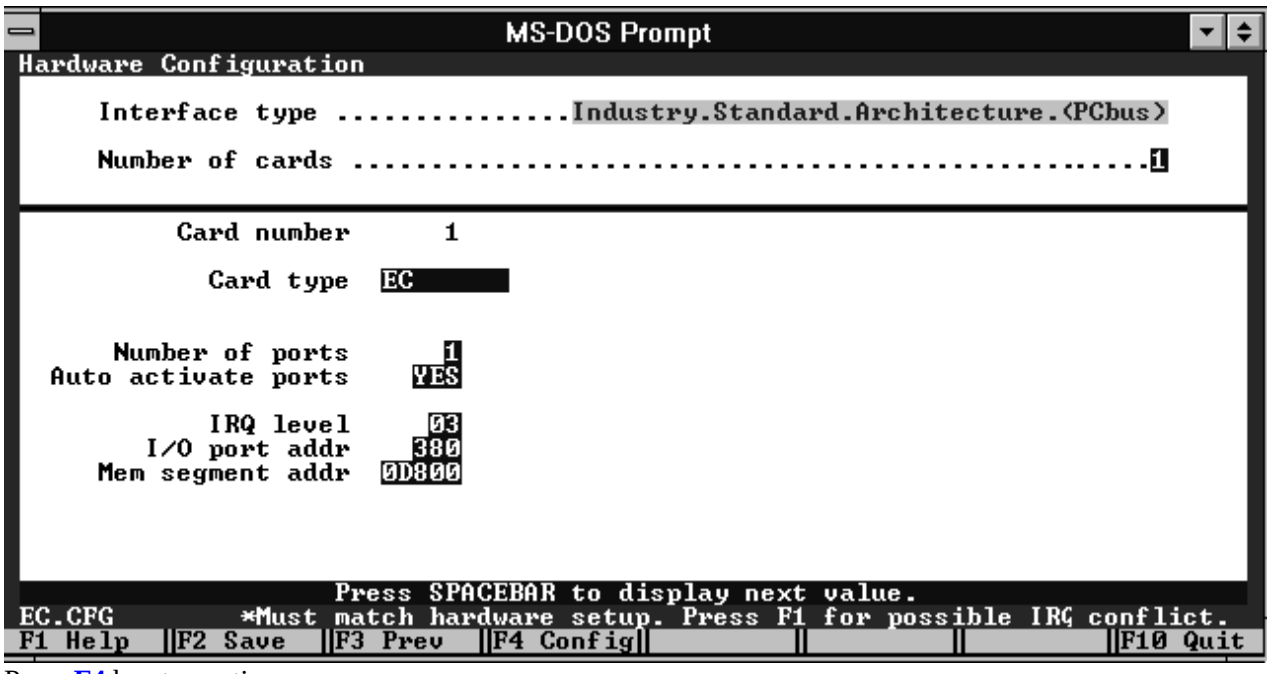
⇒ EiconCard configuration

The following panels are snapshots of the EiconCard ECCFG.EXE program with the configuration used by the Data-3 Gateway with **OSI Gateway V3R1.25**.They are presented in the order they appear in the program [Ref. 2].



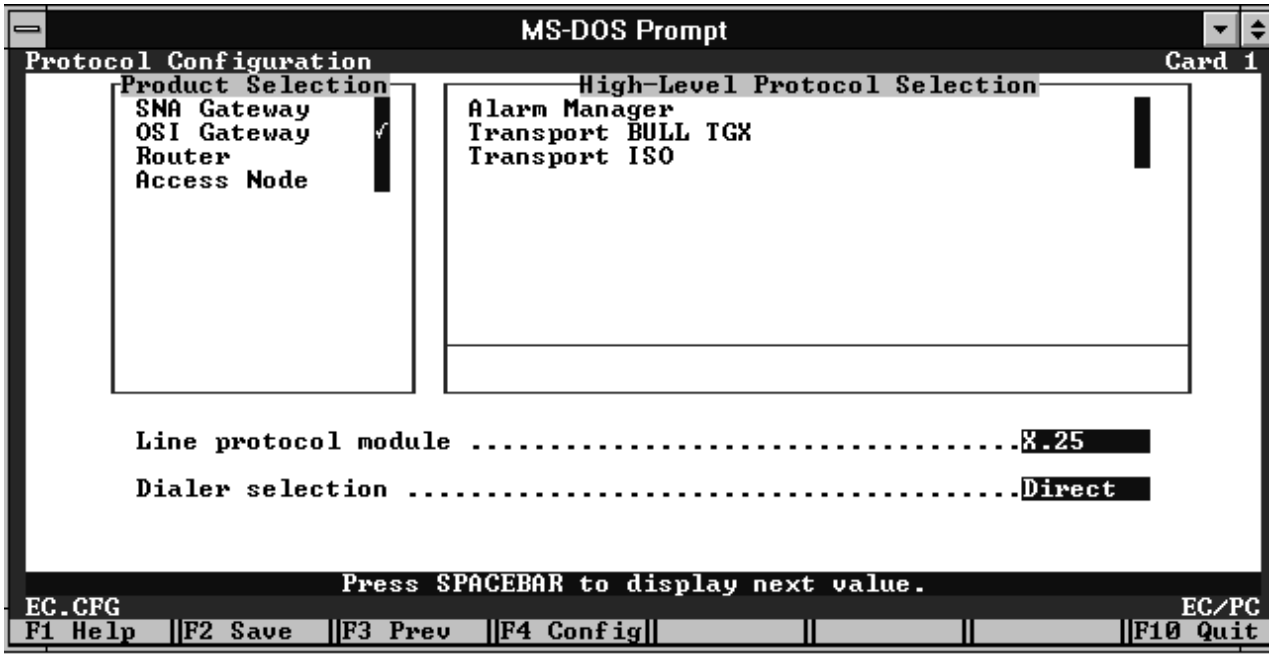
Press **F4** key to continue.

Hardware Configuration Screen



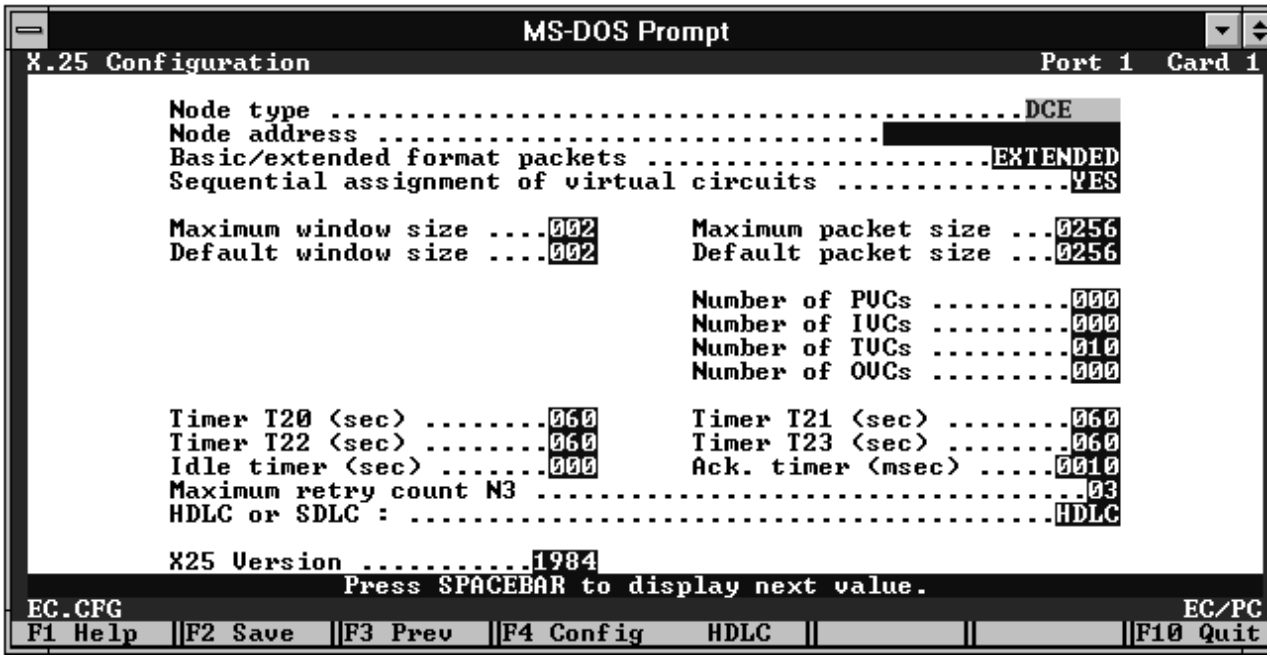
Press **F4** key to continue.

Protocol Configuration Screen



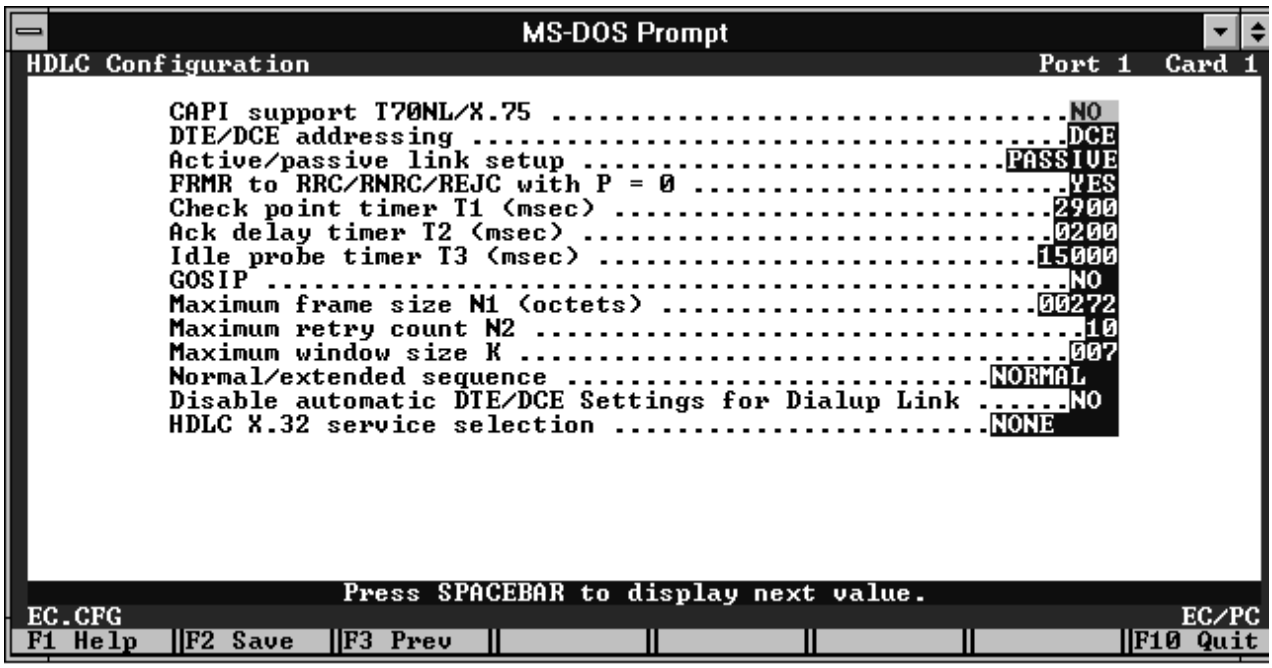
On the Line protocol module select **X.25** then press **F4** key to continue.

X.25 Configuration Screen (Sequential VC)



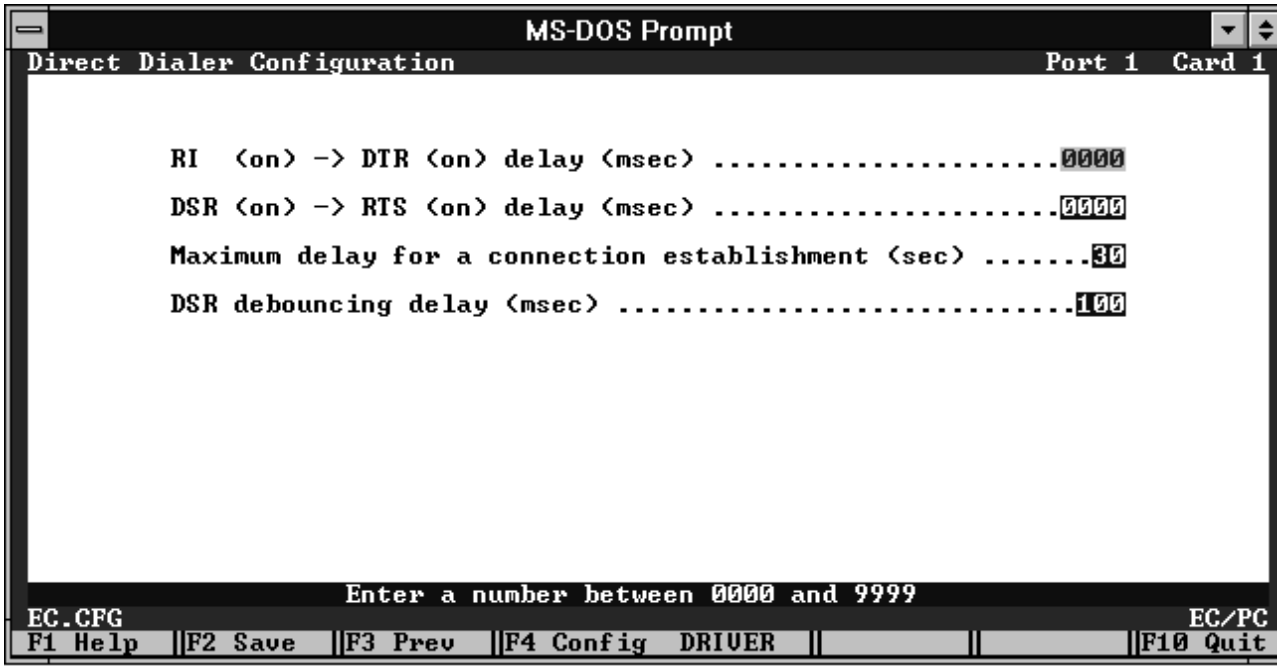
Press **F4** key to continue.

HDLC Configuration Screen


MS-DOS Prompt
HDLC Configuration
Port 1 Card 1
CAPI support T70NL/X.75 .....NO
DTE/DCE addressing .....DCE
Active/passive link setup .....PASSIVE
FRMR to RRC/RNRC/REJC with P = 0 .....YES
Check point timer T1 (msec) 2900
Ack delay timer T2 (msec) 0200
Idle probe timer T3 (msec) 15000
GOSIP .....NO
Maximum frame size N1 (octets) 00272
Maximum retry count N2 10
Maximum window size K 007
Normal/extended sequence .....NORMAL
Disable automatic DTE/DCE Settings for Dialup Link .....NO
HDLC X.32 service selection .....NONE
Press SPACEBAR to display next value.
EC.CFG
EC/PC
F1 Help
F2 Save
F3 Prev
F10 Quit

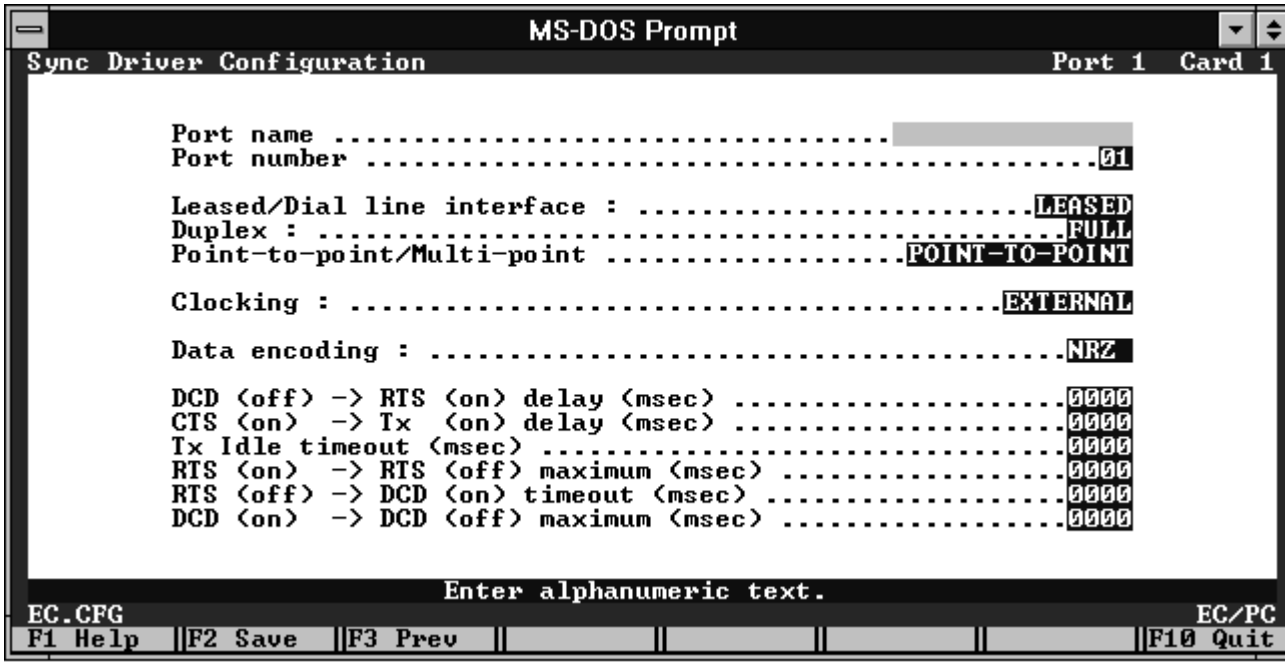
Press twice **F3** key to get back the Protocol Configuration Screen. On the Dialer selection line select **Direct** then press **F4** key to continue.

Direct Dialer Configuration Screen



Press **F4** key to continue.

Sync Driver Configuration Screen



Press **F10** key to quit.

4.4 Software set up

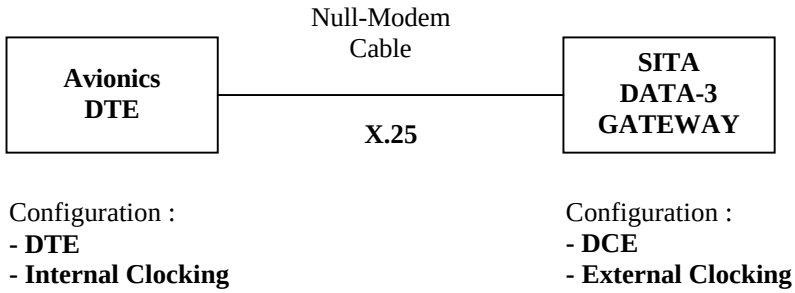
Config.sys and Autoexec.bat of the PC “SITA Data-3 Gateway” are given in **Annex 2**.

5. Connection and cable between two PCs

This section describes how to connect two EiconCards back-to-back using a null modem cable. The following table shows which null-modem cables you should use to connect specific kinds of EiconCards.

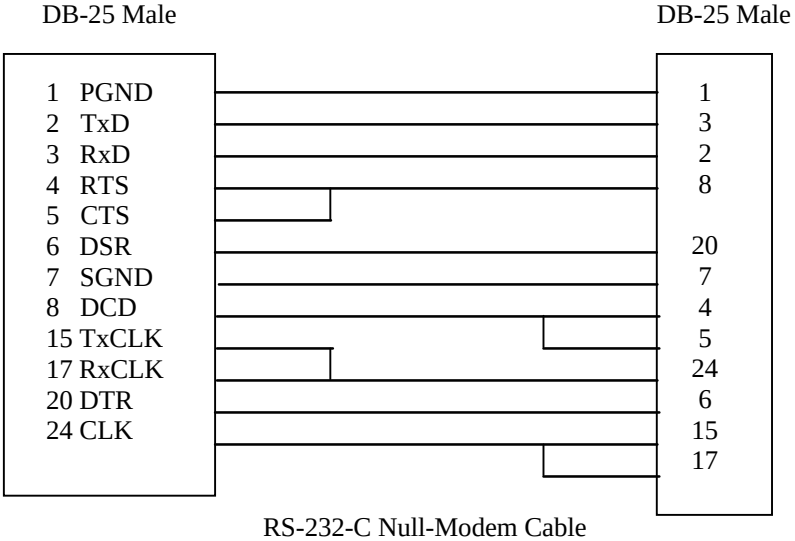
To connect these EiconCard	Via this interface	To these EiconCards	Use this cable
DNA, EC, NA, SPCC	RS-232-C	DNA, EC, NA, SPCC	RS-232-C Null-Modem Cable.
HSI, DPNA	V.24 or V.35	HSI, DPNA	V.24 / V.35 HSI Null-Modem Cable.
HSI, DPNA	X.21	HSI, DPNA	X.21 HSI Null-Modem Cable.
DNA, EC, NA, SPCC	V.24	HSI, DPNA	V.24 HSI Modem Cable,with the HSI Null-Modem Conversion Cable.

A RS-232-C Null-Modem Cable can be used to connect the PC ‘avionics DTE” and the PC “SITA Data-3 Gateway”.



Pin-out diagrams for a null-modem cable:

- The RS 232 C Null -modem cable connects an EiconCard to another EinconCard, using an RS 232 C interface.



RS-232-C Null-Modem Cable

6. Configuration of the Satfone model equipment

The Satcom system consists of a RACAL Data-2 (SATFONE model) Satellite Data Unit (SDU), a Radio Frequency Unit (RFU), a High Power Amplifier (HPA), a Duplexer and Low Noise Amplifier (D/LNA) and Low Gain Antenna (LGA).
The SDU can connect to 4 satellites, it has been connected to the closest one which is the satellite Atlantic East. The user can ask to SDU to connect to another one if required.
Some trials have been made with the satellite AOR-East.
These parameters are in a script file "Buildc58.EEC" in the c:\SDU directory.

6.1 rack configuration

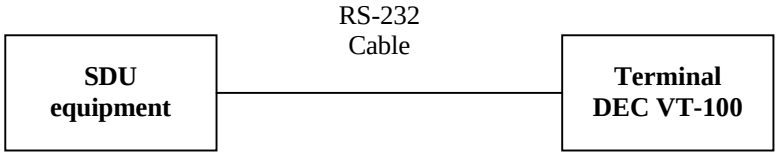
Value of the SDU discretes are 80 Hex. They are on the rack front panel.

switches SW1 to SW7 OFF (SW8 is not connected)
switch SW9 data/voice on Data.

The 38017B Hexadecimal AES identifier address is applied to SK52 connector on the rack font panel.

These both parameters can be verified with the CMT menu. From the Main SCP Menu press **E/F** (**E** /Software Module Test, **F** /Production Test Specification).

6.2 CMT configuration



The CMT consists of a PC configured to provide a VT100 terminal emulation.When connected to SCM_XB connector of AES rack (System Control Module Port B equivalent to System Control Processor of the SDU), the CMT allows access to the CMT user interface within the SDU software.
The CMT user interface provides a menu structure through which the user may access and modify various system parameters.

All the informations about menus can be found in RACAL Avionics document <<Software System Functional Specification for the Aviation Satellite Communication System>> (chapter 4, CMT user interface -issue 5) [Ref. 4].

The PC works under *MS Windows* in DEC VT-100 (ANSI) terminal emulation :

Menu << setting >>

Communications	Baud Rate.....19200 Bauds
	Data Bits.....8 Bits
	Stop Bits.....1 Bit
	Parity.....None
	Flow Control.....Xon/Xoff
	Connector.....COM1

RS 232 link between the PC COM1 and the AES rack SCM_XB.

RS-232 cable :

COM1 (DB 9)		SCM_XB (DB 25)
2 Rx	.....	2 Tx
3 Tx	.....	3 Rx
5 Gnd	.....	7 Gnd

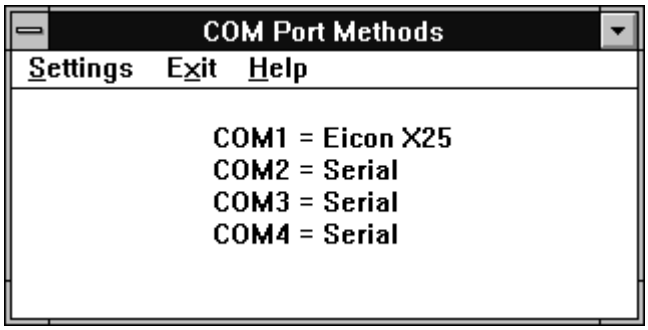
Note: The AES is configured in Automatic Log on.

7. Configuration of the COM Ports just for the PC “Avionics DTE”

1 In the X25 Communication window, choose the Method icon.

Method

2 The COM Port Method window appears.



This shows what communications method each COM port is currently using; ***serial or X.25***.

➢ **Explanation of COM Port Method Utility software:**

This utility lets you change the communications method of the COM ports from X.25 to serial and back again while Windows is running.

8. Connection start up

8.1 Introduction :

The objectif of this chapter is to obtain a Log-on with a GES (AUSSAGUEL).There is a SDU Log file in **Annex 3** and a Gateway Log file in **Annex 4**.
To get a connection Uplink or Downlink, execute the following steps.

- **Start up**
- **PAD start up "Avionics DTE"**
- **Data-3 Gateway execution**
- **Uplink or Downlink TRANSPAC connection (X.25 Network)**
- **Uplink or Downlink SITA connection (X.25 Network)**

8.2 Start up

To start the RACAL SDU equipment (SATFONE model) it is just necessary to switch on the rack to perform a log-on.
Both the avionics DTE and the Data-3 Gateway must be switched on together. Normally, when you start the PCs the following EC Commands are include in the AUTOEXEC.BAT file.

CD \OSIGATE
ECBIOS START /Int 5A /Pool 20
ECCARD START /M 16 /NCB 16

You need to have a screen similar to the following appearing on the two PCs.

```
EiconCard Device Driver (DOS)
ECBIOS 3.02 Rev.12
Copyright (c) Eicon Technology Corporation 1985-1995. All Rights Reserved.

Command completed successfully.
EiconCard Management Utility
ECCARD 3.02 Rev.07
Copyright (c) Eicon Technology Corporation 1993-1994. All Rights Reserved.

EiconCard 1: EC/PC 1M              PCB version 800112.5
EiconCard 1 initialized
Activating port(s) ...

Port 1. Network connection established.

Command completed successfully.

C:\>
```

➢ **Explanation of the commands in AUTOEXEC.BAT**

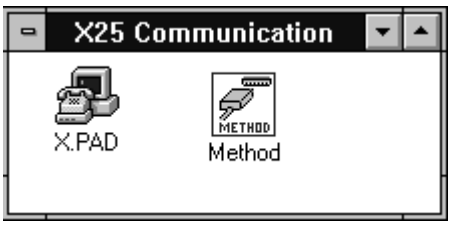
ECBIOS.EXE for DOS
ECBIOS.EXE is a program that must be loaded to operate the DOS gateway. This program links the gateway PC to the EiconCard contained within. (It is a TSR acting as a device driver.)

ECBIOS START /Int 5A /Pool 20
This command starts ECBIOS, it uses interrupt 5A for operation under Microsoft Windows, and reserves a buffer pool 20K for all sessions originating from the gateway.

ECCARD START /M 16 /NCB 16
This command loads and starts the EiconCard. ECCARD is executed after ECBIOS is loaded, and must be run to operate the gateway. The size (M) of the MAIL trace buffer and the size (Ncb) of the NCB trace buffer on the EiconCard, in kilobytes. This is used to perform an internal mail trace and an internal NCB trace.
The Eicon Technology Gateway uses Network Control Bloks (NCBs) to communicate with the EiconCard.

8.3 PAD start up "Avionics DTE"

The X.PAD icon is under the X.25 Communication Windows



1 Start the X.PAD under DOS
ECXPAD START (This executable is in this directory c:\OSIGATE) [Ref. 2].
2 Run Windows.
3 In the X.25 Communication window, choose the X.PAD icon.

The prompt **XPAD** will appear (**XPAD :**)

8.4 Data-3 Gateway execution on the PC "SITA Data-3 Gateway"

You must start the Gateway after **"Logged on"** is obtained by the SDU.

ECMODULE is used to examine the protocol information streaming through the Eicon Technology Gateway, and to provide statistical information about the various connections. The information is obtained directly from the appropriate EiconCard Loadable Module (ELM).

We can used here before starting the gateway the ECTRACE command.
The ECTRACE utility provided with Eicon's software permits to keep a trace of the X.25 packets that are exchanged by the EiconCard and the network. To use this facility with the Gateway, the following steps must be executed.

1- Enable tracing by typing :

ECMODULE TRACE X25 /S 32000 /T 259 (in the directory c:\OSIGATE) [Ref. 2]

2- Start the Gateway :

Gateway (This executable file is in this directory c:\GATEWAY) [Ref. 3]

3- After quitting the gateway----get the X.25 trace by typing :

ECMODULE TRACE X25 <- to display at the screen [Ref. 2]
ECMODULE TRACE X25 > X25TRACE.TXT <- to send to X25TRACE.TXT file

Redo step 1 to reinitialise the trace buffer.

Note : If you want execute the Data-3 Gateway without X.25 Trace run step 2.

When the Gateway program is started, the following menu will be displayed :

S) Data-3 Gateway Setup
T) Data-3 Gateway

Q) Quit to MS-DOS

If the user selects option **S**, he will be asked three questions :

GTW Identity = 0 (0= AES, 1 = GES)
Connected to = 0 (0 = SDU, 1 = STE)

429 Debugging Menu = 0

The default values are AES mode and Gateway to SDU connection. Once the Gateway is configured, its main menu can be activated by typing **T**.

A screen similar will appear.

GTW(AES)<->SDU	Logged On	Tr = 00000000	Inactive
(Event Window)			
Input : CONSOLE		Log : Off	
> _ (Command Area)			

⇒ **Command Area :**

This area is used by the operator to enter commands. The various display commands will also report information in the same area [Ref. 3].

⇒ **Event Windows :**

This is where most of the action will occur. This window will display all traceable events as they happen [Ref. 3].

All events have the following formats :

HH:MM:SS.CC Object Comment

Where HH:MM:SS.CC is the timestamp indicating when the associated event occurred, “Object” is an indication of where the action occurred and “Comment” is a description of what occurred.

Start the Data-3 Gateway by typing **start**. Then a screen similar will appear.

GTW(AES)<->SDU	Logged On	Tr = 00000000	0 VC Active
(Event Window) 14:35:16.38 Gateway Started			
Input : CONSOLE		Log : Off	
> start > _ (Command Area)			

Now you can have an uplink or a downlink connection through TRANSPAC or SITA.

Note : If an AES Logoff event occurs, the Gateway closes all active VCs.

8.5 TRANSPAC connection

⇒ For a ***downlink*** connection through TRANSPAC execute the following steps:

From the prompt XPAD of the PC “Avionics DTE” type :

XPAD : **call 0208091109606**

explanation : 0 to obtain the international
2080 this is the country code (France) DNIC
91109606 this is the TRANSPAC address of the workstation at Brétigny

To clear a connection type **Ctrl P** and **Esc**, then **clear**.

⇒ For an ***uplink*** connection through TRANSPAC execute the following steps:

Note : To execute the PAD software on a HP Workstation type (PADEM), and on the SUN Workstation type (PAD).

From the prompt of the HP Workstation type :

padem 01111516000573

explanation : 0 to obtain the international
1111 that is the DNIC address of AUSSAGUEL
5 Aeronautical mobile INMARSAT
16000573 this is the AES identification

To clear a connection type **Ctrl P** and **Enter**, then **quit**.

8.6 SITA connection

⇒ For a ***downlink*** connection through SITA execute the following steps:

From the prompt XPAD of the PC “Avionics DTE” type :

XPAD : **call 26111623323985**

explanation : 26 prefix
1116 DNIC address
2332398 SITA address of Brétigny
5 sub-address of the workstation. The sub-address is optional.

To clear a connection type **Ctrl P** and **Esc**, then **clear**.

⇒ For an ***uplink*** connection through SITA execute the following steps:

From the prompt of the HP Workstation type :

padem 01111516000573

explanation : 0 it is to obtain the international
1111 that is the DNIC address of AUSSAGUEL
5 Aeronautical mobile INMARSAT
16000573 this is the AES identification

To clear a connection type **Ctrl P** and **Enter**, then **quit**.

9. Stopping the PAD

Do **not** stop X.PAD from within Windows. X.PAD is a resident program, and like all resident programs, if it is unloaded while Windows is active it will cause Windows to crash.

At the DOS command prompt, you can type the following:

ECXPAD STOP ALL

10. Annex 1

********** **Autoexec.bat file of the PC "Avionics DTE"** **********

```
@ECHO OFF
C:\DOS\SMARTDRV.EXE /X
PROMPT $P$G
rem c:\vif\scan c: /clean
PATH C:\OSIGATE;C:\BC4\BIN;C:\WINDOWS;C:\EICON\X25WIN\DLL;C:\DOS;C:\MFT;
SET TEMP=C:\TEMP
NLSFUNC
MODE CON CODEPAGE PREPARE = ((850) C:\DOS\EGA.CPI)
MODE CON CODEPAGE SELECT = 850
KEYB US,,C:\DOS\KEYBOARD.SYS
C:\WINDOWS\mouse.COM /Y /S70
DOSKEY
VER
REM EICON statements begin
CD C:\OSIGATE
ECBIOS START /Int 5A  /Pool 20
ECCARD START /M 16 /NCB 16
REM EICON statements end
pause
ecxpad start
cd ..
pause
win
```

********** **Config.sys file of the PC "Avionics DTE"** **********

```
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE RAM X=D000-D1FF
DOS=HIGH,UMB

COUNTRY=001,850,C:\DOS\COUNTRY.SYS
FILES=40
BUFFERS=20

rem DEVICE=C:\DOS\ANSI.SYS /x
DEVICE=C:\DOS\DISPLAY.SYS CON=(EGA,,2)
rem DEVICE=C:\WINDOWS\IFSHLP.SYS
STACKS=9,256
```

11. Annex 2

********** **Autoexec.bat file of the PC "SITA Data-3 Gateway"** **********

```
rem c:\windows\smartdrv.exe

@ECHO OFF
set PROMPT=$p$g
rem c:\vif\scan c:\  /clean
set temp=c:\windows\temp
c:\dos\mouse.com
rem set comspec=c:\dos\command.com
rem call c:\lanwp.bat
doskey
set path=c:\dos;c:\ads;c:\windows;c:\tcwin\bin;c:\bc4\bin;c:\osigate;c:\gateway;
rem set path=c:\dos;c:\ads;c:\windows;c:\net\net\bin;c:\tcwin\bin;c:\bc4\bin;c:.;f:.;x:.;y:.;z:.;
c:\
rem win
ecbios start /Int 5a
eccard start /M 16 /NCB 16
cd gateway
pause
gateway
cd ..
```

********** **Config.sys file of the PC "SITA Data-3 Gateway"** **********

```
rem DEVICE=C:\DOS\SETVER.EXE
shell=c:\dos\command.com /p /E;1536
STACKS=9,256
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE X=D800-DFFF
DEVICE=C:\DOS\ANSI.SYS
DOS=HIGH,UMB
FILES=50
BUFFERS=20
REM TEST UN
rem device=c:\windows\ifshlp.sys
rem ce=c:\dos\display.sys con=(EGA,437, 1)
rem CE=C:\PLUGPLAY\DRIVERS\DOS\DWCFGMG.SYS /NOLOCK
```

12. Annex 3

********** **SDU log-file** **********

```
00:07:09.9  User : UsMn: In State <UNAVAIL_ON_HOOK> Stim <ATTEMPT_LOG_ON>
00:07:10.0  ALO  : Sat Id 0  Preference 1
00:07:10.1  ALO  : Sat Id 0, Longitude -54, Elevation 13, RamThreshold 5
00:07:11.1  ALO  :  TX INHIBIT STATE = 0x
00:07:11.7  BTMD : Tx Freq 36E3x
00:07:11.7  BTMD : Rx Freq 36B8x
00:07:11.8  ALO  : SATSEARCH AWAIT SIGNAL FOR SAT ID 00x PSMC 1x
00:07:13.5  FSPM : Rx InLock
00:07:13.5  FSPM : First Lock on P-Ch
00:07:13.5  RXCH : PLS->Demod
00:07:13.6  ALO  : >- SIGNAL_ACQ
00:07:23.6  ALO  : DSS = 2920  DNF = 1776   Signal Quality = 2ABC70x
00:07:23.6  ALO  :  SIGNAL_ACQ FOR SAT 0 = 2800752
00:07:23.7  ALO  : Sat Id 1  Preference 2
00:07:23.7  ALO  : Sat Id 1, Longitude -15, Elevation 29, RamThreshold 5
00:07:24.8  ALO  :  TX INHIBIT STATE = 0x
00:07:24.8  FSPM : Rx Lock LOST
00:07:25.4  BTMD : Tx Freq 36E3x
00:07:25.4  BTMD : Rx Freq 32BEx
00:07:25.5  ALO  : SATSEARCH AWAIT SIGNAL FOR SAT ID 01x PSMC 1x
00:07:27.9  FSPM : Rx InLock
00:07:28.0  FSPM : First Lock on P-Ch
00:07:28.0  RXCH : PLS->Demod
00:07:28.0  ALO  : >- SIGNAL_ACQ
00:07:38.1  ALO  : DSS = 2803  DNF = 1429   Signal Quality = 2DEBC2x
00:07:38.1  ALO  :  SIGNAL_ACQ FOR SAT 1 = 3009474
00:07:38.1  ALO  : Sat Id 2  Preference 1
00:07:38.2  ALO  : Sat Id 2, Longitude 178, Elevation -45, RamThreshold 5
00:07:38.3  ALO  : Sat Id 3  Preference 1
00:07:38.3  ALO  : Sat Id 3, Longitude 64, Elevation 7, RamThreshold 5
00:07:39.4  ALO  :  TX INHIBIT STATE = 0x
00:07:39.4  FSPM : Rx Lock LOST
00:07:40.0  BTMD : Tx Freq 36E3x
00:07:40.0  BTMD : Rx Freq 32E6x
00:07:40.1  ALO  : SATSEARCH AWAIT SIGNAL FOR SAT ID 03x PSMC 1x
00:07:46.5  FSPM : Rx InLock
00:07:46.5  FSPM : First Lock on P-Ch
00:07:46.5  ALO  : >- SIGNAL_ACQ
00:07:46.6  RXCH : PLS->Demod
00:07:56.6  ALO  : DSS = 2761  DNF = 2063   Signal Quality = 48162Ex
00:07:56.6  ALO  :  SIGNAL_ACQ FOR SAT 3 = 4724270
00:07:56.6  ALO  : SATSEARCH SAT 01x   PREF 2   SIGNAL-QUALITY-VALUE 3009474
00:07:56.7  ALO  : SEARCH FREQ FOR SAT  01x
00:07:56.8  FSPM : Rx Lock LOST
00:07:57.3  ALO  : START tA13
00:07:57.3  ALO  : STATE 0 AWAIT P-CH SYNC
00:07:57.4  BTMD : Tx Freq 36E3x
00:07:57.4  BTMD : Rx Freq 32BEx
00:07:59.8  FSPM : Rx InLock
```

00:07:59.8 FSPM : First Lock on P-Ch
00:07:59.9 ALO : >- SIGNAL_ACQ
00:07:59.9 ALO : STOP tA13
00:07:59.9 ALO : SET R1 IN PMA - SEND ALL
00:07:59.9 ALO : SATELLITE ID 01x
00:08:00.0 RXCH : PLS->Demod
00:08:00.0 ALO : STATE 1 AWAIT REV_NO IN BROADCAST
00:08:01.1 ALO : >- BROADCAST SU : REV_NO : 21x
00:08:01.1 ALO : REV_NO CURRENT
00:08:01.1 ALO : SET R1 IN PMA : 21x
00:08:01.2 ALO : NO SPOT BEAM TABLE
00:08:01.2 ALO : GES ID := FIRST PREFERRED GES ID
00:08:01.2 ALO : **SELECTED GES ID : 43x** **<---------- AUSSAGUEL**
00:08:01.3 FSPM : Rx Lock LOST
00:08:01.8 ALO : TUNE TO Psmc/Rsmc OF SELECTED GES
00:08:01.9 ALO : START tA13
00:08:01.9 ALO : STATE 2 AWAIT P-CH SYNC
00:08:01.9 BTMD : Tx Freq 36B6x
00:08:02.0 BTMD : Rx Freq 36B6x
00:08:03.7 FSPM : Rx InLock
00:08:03.7 FSPM : First Lock on P-Ch
00:08:03.7 RXCH : PLS->Demod
00:08:03.7 ALO : >- SIGNAL_ACQ
00:08:03.8 ALO : STOP tA13
00:08:03.8 ALO : **AES TYPE IS VOICE2/DATA2**
00:08:03.8 ALO : WrPowerVar : Init Eirp 3
00:08:03.8 ALO : -> TRG : LOG-ON-REQ
00:08:03.9 ALO : START tA11
00:08:03.9 ALO : STATE 4 AWAIT LOG-ON-CONF
00:08:09.9 ALO : >- LOG-ON CONF
00:08:09.9 ALO : AES CLASS IS : 01x
00:08:09.9 ALO : SOME MSG ACK FLAGS ZERO
00:08:10.0 ALO : STATE 4 AWAIT LOG-ON-CONF
00:08:10.5 ALO : >- P/R-CH CONTROL
00:08:10.6 ALO : SOME MSG ACK FLAGS ZERO
00:08:10.6 ALO : STATE 4 AWAIT LOG-ON-CONF
00:08:11.2 ALO : >- T-CH CONTROL
00:08:11.2 ALO : WrPowerVar : Init Eirp 3
00:08:11.3 ALO : STOP tA11 B000001x
00:08:11.3 ALO : R-CH TUNE
00:08:11.3 ALO : P-CH TUNE : 36B6x
00:08:11.4 BTMD : Rx Freq 36B6x
00:08:11.4 ALO : T-CH TUNE
00:08:11.4 ALO : -> TRG : ACKo
00:08:11.4 ALO : START tA12
00:08:11.5 ALO : STATE 5 AWAIT LOG-ON ACKo
00:08:11.5 BTMD : RBurst Freq 36E3x Rate 1
00:08:15.9 ALO : >- LOG-ON ACKo
00:08:15.9 ALO : STOP tA12
00:08:15.9 User : UsMn: In State <UNAVAIL_ON_HOOK> Stim <LOGGED_ON_CLASS1>
00:08:16.0 ALO : STATE 6 **LOGGED-ON** **<-------- Connection establish with Aussaguel**

13. Annex 4

**** Events Log File opened 95/09/22 10:04:48 ****** **GATEWAY**********

> config
Gateway Mode: AES<->SDU Routing Initiation: None
Gateway Status: Inactive SDUMon=5s Retry=60s
429 Link Status: **Logged On** GESid=**103** AESid=**16000573**
Default Priority = 7 Facility Mask = 0xffff Diagnostic = 0x93 0x26 0x00 0x00
X.25 Primary Address = ''
X.25 Address Prefix = ''
X.25 Routing DTE = ''

> start

10:05:06.38 Gateway Started

; **Routing Initiation starts when the Gateway detects the Logon of the SDU.**

10:05:06.38 BGF() Started
10:05:06.38 IWF(0) Started
10:05:06.38 IWF(0) State: IDLE
10:05:06.38 VC(0) Started
10:05:06.38 X25(?) x25xlisten(r=*, l=*)
10:05:17.32 Rx(0) CREQ(01) ch(2), len=15
01 02 a0 01 11 15 96 98 06 02 33 01 00 0b 00 .....3....
10:05:17.32 BGF() Event: SNS_CONNECT_IND (0202)
10:05:17.32 IWF(0) Event: SNS_CONNECT_IND (0202)
10:05:17.32 priority=7
10:05:17.38 VC(1) Started
10:05:17.38 IWF(1) Started
10:05:17.38 IWF(1) State: IDLE

; **Now the X.25 DTE requests a connection**

10:05:17.38 X25(?) x25xcall(r=, l=0111159698)
10:05:17.38 Call(0) Requested SSND(0111159698) -> X.25()
10:05:17.38 IWF(0) State: VC_INDICATION
10:05:17.43 IWF(0) Event: X.25 Post: cid=1, cmd=0, info=0x00, ret=0x00, len=0
c=0x00, d=0x00
10:05:17.49 priority=7
10:05:17.49 VC(0) HLE->: SNS_CONNECT_RSP usrlen=0
10:05:17.49 Tx(0) CCNF(09) ch(2), len=7
09 02 04 0b 00 02 33 3
10:05:17.49 Call(0) Connected
10:05:17.49 IWF(0) Initializing Data Transfer
10:05:17.49 IWF(0) Initializing Receive buffers
10:05:17.49 X25(1) x25recv(503)=0, err=0
10:05:17.49 VC(0) HLE->: SNS_RX_DATA_REQ len=503
10:05:17.49 IWF(0) State: VC_CONNECTED
10:05:17.60 Tx(LS)=0

```
10:05:41.98 Rx( 0) DATA(30) ch(2), no=0, len=15
        30 02 00 54 68 65 20 71 75 69 63 6b 20 62 72      0..The quick br
10:05:41.98 IWF(0) Event: SNS_RX_DATA_CMP (0f02)
10:05:41.98 X25(1) x25send(12, 0)=0, err=0
10:05:41.98 IWF(0) Event: X.25 Post: cid=1, cmd=3, info=0x00, ret=0x00, len=12
                c=0x00, d=0x00
        54 68 65 20 71 75 69 63 6b 20 62 72             The quick br
10:05:41.98 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:05:47.98 Rx( 0) DATA(30) ch(2), no=1, len=15
        30 02 01 54 68 65 20 71 75 69 63 6b 20 62 72      0..The quick br
10:05:47.98 IWF(0) Event: SNS_RX_DATA_CMP (0f02)
10:05:47.98 X25(1) x25send(12, 0)=0, err=0
10:05:48.05 IWF(0) Event: X.25 Post: cid=1, cmd=3, info=0x00, ret=0x00, len=12
                c=0x00, d=0x00
        54 68 65 20 71 75 69 63 6b 20 62 72             The quick br
10:05:48.05 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:05:54.05 Rx( 0) DATA(30) ch(2), no=2, len=15
        30 02 02 54 68 65 20 71 75 69 63 6b 20 62 72      0..The quick br
10:05:54.05 IWF(0) Event: SNS_RX_DATA_CMP (0f02)
10:05:54.05 X25(1) x25send(12, 0)=0, err=0
10:05:54.05 IWF(0) Event: X.25 Post: cid=1, cmd=3, info=0x00, ret=0x00, len=12
                c=0x00, d=0x00
        54 68 65 20 71 75 69 63 6b 20 62 72             The quick br
10:05:54.05 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:06:20.32 Rx( 0) DATA(30) ch(2), no=3, len=26
        30 02 03 54 68 65 20 71 75 69 63 6b 20 62 72 6f   0..The quick bro
        77 6e 20 66 6f 78 20 6a 75 6d                   wn fox jum
10:06:20.38 IWF(0) Event: SNS_RX_DATA_CMP (0f02)
10:06:20.38 X25(1) x25send(23, 0)=0, err=0
10:06:20.38 IWF(0) Event: X.25 Post: cid=1, cmd=3, info=0x00, ret=0x00, len=23
                c=0x00, d=0x00
        54 68 65 20 71 75 69 63 6b 20 62 72 6f 77 6e 20   The quick brown
        66 6f 78 20 6a 75 6d                          fox jum
10:06:20.38 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:06:27.71 Rx( 0) DATA(30) ch(2), no=4, len=26
        30 02 04 54 68 65 20 71 75 69 63 6b 20 62 72 6f   0..The quick bro
        77 6e 20 66 6f 78 20 6a 75 6d                   wn fox jum
10:06:27.71 IWF(0) Event: SNS_RX_DATA_CMP (0f02)
10:06:27.76 X25(1) x25send(23, 0)=0, err=0
10:06:27.76 IWF(0) Event: X.25 Post: cid=1, cmd=3, info=0x00, ret=0x00, len=23
                c=0x00, d=0x00
        54 68 65 20 71 75 69 63 6b 20 62 72 6f 77 6e 20   The quick brown
        66 6f 78 20 6a 75 6d                          fox jum
10:06:27.76 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:06:34.38 Rx( 0) DATA(30) ch(2), no=5, len=26
        30 02 05 54 68 65 20 71 75 69 63 6b 20 62 72 6f   0..The quick bro
        77 6e 20 66 6f 78 20 6a 75 6d                   wn fox jum
10:06:34.38 IWF(0) Event: SNS_RX_DATA_CMP (0f02)
10:06:34.38 X25(1) x25send(23, 0)=0, err=0
10:06:34.38 IWF(0) Event: X.25 Post: cid=1, cmd=3, info=0x00, ret=0x00, len=23
                c=0x00, d=0x00
        54 68 65 20 71 75 69 63 6b 20 62 72 6f 77 6e 20   The quick brown
        66 6f 78 20 6a 75 6d                          fox jum
```

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10:06:34.43 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:06:43.98 Rx( 0) RSET(33) ch(2), c=07, d=26, len=4
        33 02 07 26                              3..&
10:06:43.98 VC( 0) Remote Reset
10:06:43.98 IWF(0) Event: SNS_R_RESET_IND (1202)
10:06:43.98 IWF(0) SNS Reset(1202) c=07, d=26
10:06:43.98 X25(1) x25reset(c=07, d=26)
10:06:44.05 IWF(0) State: VC_RESET
10:06:44.05 IWF(0) Event: X.25 Post: cid=1, cmd=10, info=0x02, ret=0x00, len=2
                c=0x00, d=0x00
        00 00                                    ..
10:06:44.05 VC( 0) HLE->: SNS_RESET_RSP
10:06:44.10 Tx( 0) 10:06:44.10 IWF(0) Initializing Receive buffers
10:06:44.10 X25(1) x25recv(503)=-1, err=261
RCNF(3b) ch(2), len=2
        3b 02                                    ;.
10:06:44.10 VC( 0) HLE->: SNS_RX_DATA_REQ len=503
10:06:44.10 IWF(0) State: VC_CONNECTED
10:06:44.16 Tx(LS)=0

;  The Ground DTE now clears the connection
10:07:04.32 Rx( 0) CREL(10) ch(2), c=00, d=99, len=4
        10 02 00 99                              ....
10:07:04.32 VC( 0) Remote Clear
10:07:04.32 IWF(0) Event: SNS_R_DISCONNECT_IND (0702)
10:07:04.32 IWF(0) SNS Remote Clear(0702) c=00, d=99
10:07:04.32 VC( 0) HLE->: SNS_DISCONNECT_RSP
10:07:04.32 Tx( 0) CCMP(18) ch(2), len=2
        18 02                                    ..
10:07:04.32 X25(1) x25hangup(c=00, d=99)
10:07:04.38 IWF(0) State: VC_CLEAR
10:07:04.38 IWF(0) Event: X.25 Post: cid=1, cmd=7, info=0x00, ret=0x0a, len=0
                c=0x00, d=0x00
10:07:04.38 IWF(0) Event: X.25 Post: cid=1, cmd=8, info=0x23, ret=0x00, len=0
                c=0x00, d=0x00
10:07:04.38 Call(0) Cleared
10:07:04.38 IWF(0) State: VC_TERMINATED
10:07:04.43 Tx(LS)=0
10:07:05.38 BGF()  Event: BGF_FREE_IWF (0017)

;  Finally, the gateway is stopped by the operator.

>  stop

10:56:26.16 Gateway Stopped
10:56:26.16 BGF()  Event: Destroy (0103)
10:56:26.16 X25(0) x25cancel()
10:56:26.16 IWF(1) Event: Destroy (0103)
10:56:26.16 IWF(1) Local Clear(0103) c=85, d=e2
10:56:26.16 IWF(1) State: VC_TERMINATED

>  quit
**** Events Log File closed 95/09/22 10:56:12 ****
```